

FOURTH FIVE-YEAR REVIEW REPORT FOR MUSKEGO SANITARY LANDFILL SUPERFUND SITE WAUKESHA COUNTY, WISCONSIN



Prepared by

U.S. Environmental Protection Agency Region 5 Chicago, Illinois

Richard C. Karl, Director Superfund Division

Date

TABLE OF CONTENTS

List	of Acronyms	4
Exe	cutive Summary	5
Five	e-Year Review Summary Form	6
I.	Introduction	8
II.	Progress Since Last Review Remedy Implementation Activities System Operations/Operation and Maintenance Activities	
Ш.	Five Year Review Process Administrative Components Community Notification and Involvement Document Review Data Review Site Inspection Interviews	.12
IV.	Technical Assessment Question A: Is the remedy functioning as intended by the decision documents? Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid? Question C: Has any other information come to light that could call into question the protectiveness of the remedy? Technical Assessment Summary	.15
v.	Issues/Recommendations and Follow-up Actions	.16
VI.	Protectiveness Statement(s)	.16
VII.	Next Review	

Table	e and a second second			_
Table 1 – Protectiveness Determinations/St	atements from the 20	09 FYR		9
Table 2 – Status of Recommendations from	the 2009 FYR			9
Table 3 – Summary of Planned and/or Impl	emented ICs			11
Table 4 – Issues and Recommendations/Fo	llow-up Actions			16
	 J			
Figures				
Site Location Map	,			
Site Property IC Map			•	
·	v		-	

Appendices

Appendix A – Site Background and History

Appendix B –1993 Deed Restriction/ Special Casing Requirements

Appendix C -- Five-Year State Notification Letter and Newspaper Ad

Appendix D – Site Monitoring Data

Appendix E – Site Inspection Checklist and Site Photo

LIST OF ACRONYMS

CERCLA Comprehensive Environmental Response, Compensation, and Liability Act

CD Consent Decree

CFR Code of Federal Regulations

CIC Community Involvement Coordinator

EGMWP Expanded Groundwater Monitoring Work Plan EPA United States Environmental Protection Agency

ES Enforcement Standard

ESD Explanation of Significant Differences

FYR Five Year Review

GWOU Groundwater Operable Unit

IC Institutional Control

ICIAP Institutional Control Implementation and Assurance Plan

MCL Maximum Contaminant Level mg/kg milligrams per kilogram

MMSD Milwaukee Metropolitan Sewerage District

MNA Monitored Natural Attenuation
NCP National Contingency Plan
NPL National Priorities List
O&M Operation and Maintenance

OU Operable Unit

PAL Preventative Action Limit

ppb Parts per Billion ppm Parts per Million

PRP Potentially Responsible Party

RA Remedial Action

RAO Remedial Action Objective

RD Remedial Design

RI/FS Remedial Investigation/ Feasibility Study

ROD Record of Decision

RPM Remedial Project Manager

Site Muskego Sanitary Landfill Superfund Site

SVE Soil vapor extraction

SCOU Source Control Operable Unit

TCE Trichloroethene

UU/UE Unrestricted Use/ Unlimited Exposure

μg/L Micrograms per Liter

VC Vinyl Chloride

VOC Volatile Organic Compound

WDNR Wisconsin Department of Natural Resources

WMWI Waste Management of Wisconsin

EXECUTIVE SUMMARY

This is the fourth Five-Year Review (FYR) for the Muskego Sanitary Landfill Superfund Site (Site) located in Muskego, Waukesha County, Wisconsin. The purpose of this FYR is to review Site information to determine if the remedy is and will continue to be protective of human health and the environment. The triggering action for this statutory FYR was the signing of the previous FYR on August 21, 2009.

The Muskego Sanitary Landfill Site (Site) includes a former landfill area which occupies approximately 60 acres and is located north of Janesville Road (State Highway 24) and east of Crowbar Road in the City of Muskego, Wisconsin (See Figure 1). The Site is surrounded within one mile by industrial, commercial, residential and some agricultural properties. Located directly north of the Site is a closed landfill named Stone Ridge which is operated by Waste Management of Wisconsin (WMWI), and located west of the Site is a sand and gravel pit currently operated by the Payne & Dolan Company. Residential homes are located to the south and east of the Site along Janesville Road and Hillendale Drive.

Components of the remedial actions included in the Muskego Sanitary Landfill 1992 Source Control Operable Unit (SCOU/OU1) ROD, 1995 Groundwater Operable Unit (GWOU/OU2) ROD, and 2010 Explanation of Significant Differences (ESD) are implemented under the 2011 Consent Decree (CD). Remedy components include the Site Landfill cap, soil vapor and landfill gas extraction system, leachate collection system, groundwater treatment, institutional controls (ICs), and Site maintenance and monitoring. The 2010 ESD included a requirement for an evaluation of monitored natural attenuation (MNA) as a groundwater treatment component, in order to be incorporated at the Site. Eight quarterly sampling events were completed between 2012 and 2014 which support the MNA remedy component at the Site. A MNA Evaluation Report was submitted on June 30, 2014 and is under final review for approval.

The Site remains in the operation and maintenance (O&M) stage with ongoing scheduled maintenance and monitoring. ICs in the form of restrictive covenant(s) have been initiated but need to be finalized and recorded with Waukesha County. The Site remedy is currently protective of human health and the environment in the short term. Soil and groundwater remedy components are effectively in place and the Site is in O&M. In order for the Site remedy to be protective in the long term, enhanced ICs for the Site need to be implemented. Protectiveness will be ensured by implementing, maintaining, monitoring and enforcing ICs as well as maintaining the Site remedy components.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site Name:

Muskego Sanitary Landfill

EPA ID:

WID000713180

Region: 5

State: WI

City/County: Muskego, Waukesha

SITE STATUS

NPL Status: Final

Multiple OUs?

Has the site achieved construction completion?

Yes

Yes

Lead agency: EPA

Author name (Federal or State Project Manager): Jeff Gore

Author affiliation: Remedial Project Manager

Review period: 12/2/2013 – August, 2014

Date of site inspection: 3/18/2014

Type of review: Statutory

Review number: 4

Triggering action date: 08/21/2009

Due date (five years after triggering action date): 08/21/2014

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:

None

Issues and Recom	mendations Identific	ed in the Five-Year	Review:			
OU1, OU2	Issue Category: In	stitutional Control	s			
	Issue: Enhanced ICs for the Site need to be implemented and maintained so that they remain effective over time.					
	Recommendation	: Finalize and record	Restrictive Covenant			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date		
No	Yes	PRP	EPA/State	9/30/2015		

OU1, OU2	Issue Category: Institutional Controls Issue: Long-term stewardship must be assured which includes maintaining and monitoring effective ICs at the Site.					
	Recommendation: Finalize ICIAP incorporating updated Municipal Well Head Protection Plan.					
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date		
No	Yes	PRP	EPA/State	9/30/2015		

OU1, OU2, Sitewide Protectiveness Statement

Protectiveness Determination:

Short-term Protective

Protectiveness Statement:

The Muskego Sanitary Landfill Site SCOU remedy is currently protective of human health and the environment in the short term. Soil and groundwater remedy components are effectively in place and the Site is in O&M. In order for the Site remedy to be protective in the long term, enhanced ICs for the Site need to be implemented. Protectiveness will be ensured by implementing, maintaining, monitoring and enforcing ICs as well as maintaining the Site remedy components.

I. INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) prepares FYRs pursuant to Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP). CERCLA 121 states:

"If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews."

EPA interpreted this requirement further in the NCP at 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

"If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such actions no less often than every five years after the initiation of the selected remedial action."

The EPA conducted this FYR of the remedy implemented at the Muskego Sanitary Landfill Site in Muskego, Waukesha County, Wisconsin. EPA is the lead agency for developing and overseeing the implementation of the remedy for the Site. This review was conducted by Jeff Gore, EPA Remedial Project Manager (RPM) for the Site. Jim Delwiche, as project manager for the Wisconsin Department of Natural Resources (WDNR), the support agency, has assisted EPA with the FYR including the Site inspection and provided input from WDNR during the FYR process.

This is the fourth FYR for the Site. The triggering action for this statutory review is the completion date of the third FYR signed on August 21, 2009. A five-year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE). The Site consists of two OUs which are addressed in this FYR.

II. PROGRESS SINCE THE LAST REVIEW

Table 1: Protectiveness Determinations/Statements from the 2009 FYR

OU#	Protectiveness Determination	Protectiveness Statement
OU1, OU2, Sitewide	Short-term Protective	Overall, the Muskego Sanitary Landfill Site remedy is protective of human health and the environment in the short term. Continued long term protectiveness requires further evaluation of the groundwater remedy, institutional controls, and operation & maintenance of Site remedy and monitoring systems.

Table 2: Status of Recommendations from the 2009 FYR

OU#	Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Party	Original Milestone Date	Current Status	Completion Date (if applicable)
OU2	Additional evaluation and data is needed to enhance Site remedy and confirm stable and/or receding groundwater contamination	Evaluate MNA at Site including up to 10 additional groundwater monitoring wells	PRPs	EPA/ WDNR	Sept. 2010	Completed	2014
OU1, OU2	Existing Site ICs, Deed Restriction	Implement Site restrictive covenants for entire 60 acre area that more effectively run with the land	PRPs	EPA/ WDNR	Sept., 2010	Ongoing	
OU2	ICs for monitoring potential groundwater contam- ination	Implement Municipal groundwater ordinance and municipal well head protection plan	PRPs, City of Muskego	EPA/ WDNR	Sept. 2010	Ongoing	
OU1, OU2	Long term stewardship for effective ICs	Prepare ICIAP	PRPs	EPA/ WDNR	Sept. 2010	Ongoing	

Recommendations Status:

- 1) An ESD was completed and signed on September 13, 2010 which included the requirement for a two year MNA evaluation at the Site. An RD/RA CD with the PRPs was also completed and entered in court on July 21, 2011, requiring the PRPs to conduct that evaluation. The two year MNA evaluation monitoring under the November 2011 Work Plan included eight quarterly O&M sampling and progress report events, and was completed with the groundwater monitoring event in spring of 2014. The two years of evaluation monitoring and progress reports support MNA at the Site. A MNA Evaluation Report was submitted by the PRPs to EPA and WDNR on June 30, 2014 and is under final review for approval.
- 2) A restrictive covenant for the Site landfill area needs to be finalized and recorded. Initial discussions regarding drafting the covenant from the Wisconsin model document have taken place. The PRPs are preparing updated Site landfill area parcel mapping to be incorporated in the draft covenant.
- 3) A requirement for a special casing area has been completed for the Site with WDNR and the City of Muskego and is included in Appendix B. The special casing area is being utilized as an alternative to a municipal ordinance and will serve to ensure that potential exposure to groundwater areas potentially impacted by the Site will be restricted. A Communication Contingency Plan addressing communications with the City of Muskego and their Municipal Wellhead Protection Plan was also completed in November 2013. An updated Municipal Wellhead Protection Plan needs to be submitted from the City of Muskego.
- 4) The Site Institutional Controls and Implementation Assurance Plan (ICIAP) has been drafted and reviewed by EPA and WDNR, and is planned on being finalized once the details of the proposed Site landfill area restrictive covenant become available.

Remedy Implementation Activities

Remedy implementation is taking place under the 1992 ROD, 1995 ROD, the 2010 ESD, and the 2011 CD. Remedial activities are detailed in Appendix A.

The development of ICs at the Site which include deed restrictions and Site controls were required by the 1992 ROD, 1995 ROD, and 2010 ESD to restrict property use, maintain the integrity of the remedy, and assure the long term protectiveness for areas which do not allow for (UU/UE). A summary of the implemented and planned ICs for the Site is listed in Table 3 and further discussed below.

Table 3: Summary of Planned and/or Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
On-site soil landfill area (~21 acres). Property parcel owned by Carl Wauer/ WMWI & operated by WMWI.	Yes	Yes	Multiple	Restricts commercial or residential development of the property.	Deed Restriction recorded Doc. No. 1627-0926 at Waukesha County Recorder's office on January 6, 1993 (implemented).
On-site soil contamination — Site landfill areas/ groundwater. Property owned by Carl Wauer/ WMWI & operated by WMWI.	Yes	Yes	Multiple	Prohibits use of land, groundwater underlying Site and assures integrity of landfill & other RA components.	Restrictive Covenant(s) for Site property that run with the land, including modification of 1993 recorded Deed Restriction to run with the land (planned).
Groundwater & real estate use for areas downgradient and adjacent to landfill: Groundwater area where contamination from landfill area may have migrated.	Yes	Yes	Multiple	Restricts use of groundwater and installation of private groundwater wells.	Special casing area, Municipal Well Head Protection Plan for monitored areas potentially impacted by groundwater contamination associated with the Site (Special casing area completed).

The Site map Figures 1 and 2 attached to this document outline the landfill property boundary and the areas that may need to be addressed by ICs at the Site.

Current and Planned Institutional Controls

ICs Currently Implemented: A Deed Restriction (Doc. No. 1627-0926) was recorded at the Waukesha County Recorder's office on January 6, 1993, on a 21 acre landfill area parcel of the Site owned by Carl Wauer and operated by WMWI, which restricts commercial or residential development of the property. A special casing area has been completed for the Site since 2004 with WDNR and the City of Muskego and was updated in 2009 for the area outlined in Figure 2.

Planned ICs: ICs in the form of restrictive covenant(s), and an updated municipal well head protection plan that will remain effective over the long term are necessary for the Site. These ICs will assure that all property on the Site is properly restricted, that use of groundwater impacted and potentially impacted by the Site is properly restricted, and that the remedy is protective over the long term. The additional restrictive covenant(s) would cover all of the 60 acre landfill area, and include a modification of the recorded 1993 Deed Restriction so that it more effectively and permanently runs with the land. The

updated municipal well head protection plan would assure that a governmental control was in place to monitor and maintain a municipal well that may be close to Site-related contamination.

<u>Current Compliance</u>: Based on inspections and interviews, EPA is not aware of any uses of the Site, including groundwater uses, which are inconsistent with the objectives which will be served by the ICs. Long-term compliance with ICs will be accomplished by finalizing and recording ICs in the form of a restrictive covenant(s) for the Site. As of the date of this FYR, no unauthorized development or use of Site groundwater has occurred.

<u>Long-Term Stewardship</u>: Since compliance with the ICs is necessary to assure the protectiveness of the remedy, planning for long-term stewardship is required. Long-term stewardship will ensure effective ICs are maintained and monitored and that the remedy continues to function as intended. The finalization of the Site ICIAP will include assurance that long-term stewardship procedures are in place. For example, regular inspections of ICs at the Site occur to certify that the ICs are in place and are effective.

System Operation / Operation and Maintenance Activities

The O&M program at the Muskego Sanitary Landfill Superfund Site includes SVE system effluent and landfill gas sampling, leachate extraction system and groundwater extraction system effluent sampling, groundwater monitoring, required inspection and maintenance of all the components of the Site remedy, and institutional controls compliance. The O&M program takes place under the updated 2012 Site O&M Plan and ongoing O&M reports.

III. FIVE-YEAR REVIEW PROCESS

Administrative Components

The initiation of the Muskego Sanitary Landfill Site FYR took place when a notification letter was sent to WDNR by EPA. The Site FYR was led by EPA with Jeff Gore as Remedial Project Manager for the Site and Susan Pastor as the Community Involvement Coordinator (CIC). Jim Delwiche of the WDNR assisted in the review as the project manager for the state support agency. Since the Site involves an enforcement action under a CD, the PRPs were also notified of the five-year review process including the Site inspection.

The Site FYR, which began with the WDNR notification letter on December 2, 2013, consisted of the following components:

- Community Involvement;
- Document Review;
- Data Review;
- Site Inspection; and
- Five-Year Review Report Development and Review.

Community Notification and Involvement

Activities to involve the community in the five-year review process were initiated when the EPA CIC was copied on the December 2013 notification letter sent to WDNR by the EPA RPM. The RPM and the CIC then worked together to update the public information for the Site and produce an advertisement notice for the local newspaper. A notice was published in the Milwaukee, Wisconsin Journal Sentinel newspaper on December 26, 2013, stating that there was a five-year review and inviting the public to submit any comments to the EPA. The results of the review and the report will be made available at the Site information repository located at the Muskego Public Library, S73 W16663 Janesville Road, Muskego, Wisconsin and the EPA website.

Document Review

This FYR consisted of a review of relevant documents including O&M records, progress reports and monitoring data. Applicable soil and groundwater remedial action objectives and standards in the Site documents were also reviewed. Additional documents reviewed included the 1999, 2004 and 2009 Site FYR Reports; the 2011 RD/RA CD; the 1992 ROD; the 1995 ROD; the 2010 ESD; 2011 RD/RA Work Plan; and 2012 O&M Plan.

Data Review

SCOU Data Review:

The Muskego Sanitary Landfill Superfund Site O&M sampling program is outlined in the 2012 O&M Plan. The SCOU O&M program includes SVE system effluent and landfill gas sampling, effluent sampling of the combined leachate extraction system and groundwater extraction system, and inspections of the landfill cover components and ICs.

Landfill gas sampling data results include percentages of methane, carbon dioxide and oxygen. Site results over the history of the O&M period have shown a decline in the methane concentrations of the system blower effluent, with landfill gas in the first FYR report resulting in 38% methane in April 1999 as compared to 32% methane in March 2014. Since there is a landfill gas flare system at the Site, this methane is combusted and not released to the atmosphere.

Landfill leachate volumes for the Muskego Sanitary Landfill Site are measured at a Site flow meter, before being released to be combined with the Stone Ridge Landfill effluent leachate. Leachate volumes at the Site totaled approximately 215,000 gallons over the three month period between January and March 2014. Results regarding effluent volumes are reported monthly to WDNR and quarterly to the Milwaukee Metropolitan Sewerage District (MMSD) to assure they remain in permit compliance.

Periodic maintenance involving landfill surface grading and leachate collection repairs take place at the Site. Future SCOU data needs will include an ongoing evaluation of the existing SVE system, landfill gas collection system, and leachate extraction system as outlined under the 2012 O&M Plan and the 2013 Remedy Optimization Report to demonstrate and assure that proper source control is being maintained over the long term at the Site.

GWOU Data Review:

The Site O&M program for the GWOU is also outlined in the 2012 Site O&M Plan. The monitoring program also includes sampling in shallow and deep aquifer locations, sampling of a municipal well approximately one mile east of the Site, and periodic sampling of some nearby private wells.

The primary concern in the current groundwater sampling program is the implementation of an MNA evaluation monitoring program which began in 2012, where the VOC detections have been relatively low and vinyl chloride (VC) is the primary contaminant of concern. Since WDNR has an enforcement standard for VC at 0.2 ppb that is substantially below the EPA maximum contaminant level (MCL) of 2 ppb, VC has become the contaminant of concern at the Site. Eight quarterly MNA sampling events have taken place at the Site to verify the MNA program. Monitoring occurs in both the upper and lower sand units of the groundwater aquifer. Results from the seventh evaluation monitoring event were reported in April 2014.

VC was found at generally low concentrations in a few locations near the landfill to the east, southeast and south, and generally not detected or minimally detected by monitoring wells further from the landfill. In the upper sand unit, the highest VC result was 1.2 ppb at MW01 to the east and 0.2 ppb at E135A to the south of the landfill. In the lower sand unit, the highest VC result was 5.3 ppb at MW19A to the east and 0.5 ppb at E137B to the south of the landfill. MW18A near the landfill to the southeast in the lower sand unit had the highest total volatile organic compounds (VOCs) of 24.0 ppb, which included 0.8 ppb VC, 7.6 ppb cis-1-2-dichloroethene, 7.8 ppb dichloroethene total and 1.5 ppb 1-1-dichloroethane.

The eighth evaluation monitoring event was completed in the spring of 2014 and reported in July 2014. Concentrations of groundwater VOCs were generally consistent with historical results over the 2 year MNA quarterly sampling period and provided support for utilizing MNA for the Site groundwater remedy. With VOCs dropping off to being non-detect in the monitoring wells further from the landfill, MNA sampling supports that the low level VOC contaminants for the Site are breaking down in the groundwater aquifer and that groundwater performance standards could be reached in a reasonable period of time. An MNA Evaluation Report dated June 30, 2014 was submitted to EPA and WDNR, and is under final review for approval.

Additional groundwater sampling at the Site includes the sampling of 15 nearby private wells and one municipal well. One private well located south of the Site on Henneberry Drive, which had a previous VC level detected of 0.2 ppb, was replaced in November 2009 after the last FYR. The new private well was installed in a deeper portion of the groundwater aquifer where there was no detection of vinyl chloride. There have no other detections of VC at or above 0.2 ppb at any of the private well samples since the last FYR.

Site Inspection

The Site inspection for this FYR was performed on March 18, 2014 by Jeff Gore of EPA and WDNR project manager Jim Delwiche. One of the purposes of the FYR inspection is to support a determination of the protectiveness at the Site. The FYR site inspection checklist was used as a guideline for the Site inspection, and is attached to this report as Appendix E.

The Site access fence remained in place, a sign was present at the Site entrance on the security gate, and

the gate was open upon arrival for the inspection as the PRP contractor was there performing O&M monitoring. The Site was found to be in good condition during the inspection and free of debris. Some remote areas of the landfill Site are used for storage of equipment.

The Site landfill was found to have some snow on the cover and the ground was firm due to the recent cold weather. A walk over and around the perimeter of the landfill found no significant cracks or surface erosion, although there were some areas of standing water on the perimeter due to melting snow. The grass cover was brown and matted down from the snow melt.

All groundwater monitoring wells were properly locked except for the wells which were being sampled by the PRP contractor. The leachate collection system inspected was found to be properly in place and in good working order. In summary, no major issues were found at the Site during the inspection. Jeff Gore and Jim Delwiche then proceeded to leave the Site area and drive through the local neighborhood.

Interviews

During the FYR process, discussions took place involving two local residents who had questions concerning the O&M program at the Site. The residents contacted EPA and WDNR by email and telephone. Both Jim Delwiche and Jeff Gore responded to the residents' questions and concerns.

IV. TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents?

Yes: Remedial action components included in the Muskego Sanitary Landfill 1992 ROD, 1995 ROD, 2010 ESD, and 2011 CD have been implemented, except for EPA and WDNR final review and approval of the MNA Evaluation Report dated June 30, 2014 and enhanced IC implementation. The Site remains in operation and maintenance The Site Landfill cap area, soil vapor and landfill gas extraction system, and leachate collection system are functional and operational; with post closure maintenance and monitoring assuring protectiveness. MNA is now to be incorporated as part of the GWOU remedy as outlined under the O&M program and MNA evaluation, and is found to be functioning in order to achieve Site groundwater performance standards over the long term. Improved ICs in the form of a restrictive covenant(s) for the Site property owner needs to be completed and recorded, to complement the special casing area and restrictions which are already in place. The ICIAP also needs to be finalized. Finalizing the ICs will assure that the remedy is effective in the long-term.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy section still valid?

Yes. The assumptions and data with the inclusion of the 2010 ESD and 2011 CD are still valid, and there have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy. There has been no change to the risk assessment methodology utilized at the Site that would affect the protectiveness of the remedy. The remedy is functioning as expected.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. There is no information generated during the five year review process or other information that calls into question the protectiveness of the remedy. The MNA evaluation has looked at low levels of vinyl chloride in groundwater downgradient of the landfill. This evaluation is intended to determine whether Site-related contamination is stable and/or receding, to assure that data is provided to confirm long term protectiveness.

Technical Assessment Summary

According to the data reviewed and the Site inspection, the remedy is functioning as intended by the 1992 ROD, 1995 ROD, 20010 ESD, and 2011 CD. . Ongoing O&M Site monitoring continues to provide assurance that the remedy is functioning as intended. No other additional information has been identified which would call into question the protectiveness of the remedy

V. ISSUES/RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Table 4: Issues and Recommendations/Follow-up Actions

OU#	Issue	Recommendations/	Party	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
		Follow-up Actions	Responsible			Current	Future
OU1, OU2	Enhanced ICs for the Site need to be implemented and maintained so that they remain effective over time.	Finalize and record Restrictive Covenant.	PRP	EPA/ State	9/30/2015	No	Yes
OU1, OU2	Long-term stewardship must be assured which includes maintaining and monitoring effective ICs.	Finalize ICIAP.	PRP	EPA/ State	9/30/2015	No	Yes

VI. PROTECTIVENESS STATEMENT(S)

SCOU, GWOU & Sitewide Protectiveness Statement

Protectiveness Determination:

Short-term Protective

Protectiveness Statement:

The Muskego Sanitary Landfill Site remedy is currently protective of human health and the environment in the short term. Soil and groundwater remedy components are effectively in place and the Site is in O&M. In order for the Site remedy to be protective in the long term, enhanced ICs for the Site need to be implemented. Protectiveness will be ensured by implementing, maintaining, monitoring and enforcing ICs as well as maintaining the Site remedy components.

VII. NEXT REVIEW

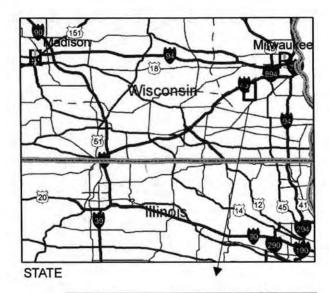
The next FYR report for the Muskego Sanitary Landfill Superfund Site is required five years from the completion date of this review.

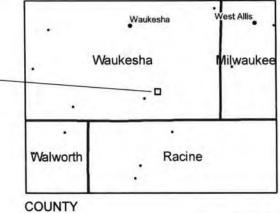


Muskego Sanitary Landfill Muskego, Waukesha Cty., WI

EPA ID# WID000713180









EPA Disclaimer: Please be advised that areas depicted in the map have been estimated. The map does not create any rights enforceable by any party. EPA may refine or change this data and map at any time.

Producted by U.S. EPA Region 5 on Image Date: June 9, 2009

Figure 2:

U.S. Environmental Protection Agency Superfund

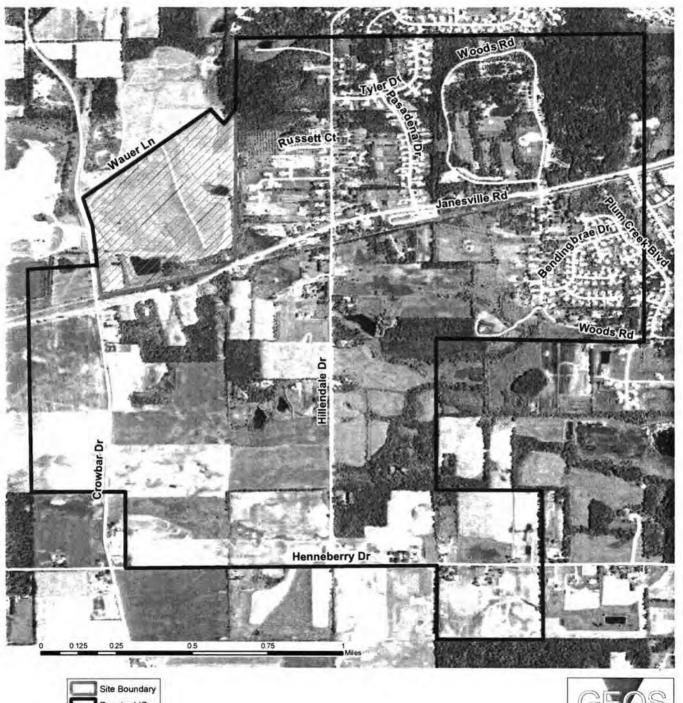
Institutional Control (IC) Review

Areas Depicting Required Institutional Controls



Muskego Sanitary Landfill Muskego, Waukesha Cty., WI

EPA ID# WID000713180



Required ICs

EPA Disclaimer: Please be advised that areas depicted in the map have been estimated. The map does not create any rights enforceable by any party. EPA may refine or change this data and map at any time.

Producted by U.S. EPA Region 5 on Image Date: June 9, 2009

APPENDIX A - EXISTING SITE INFORMATION

A. SITE CHRONOLOGY

	Table 1. Chronology of Site Events				
Date	Event				
1940s	Portions of Site property are operated as sand and gravel pit				
1954	Property owner receives permit from Muskego to operate public dump				
1970s	Muskego Rendering Plant operates seepage lagoons, treatment lagoons and wastewater ponds				
1971	Public dump site licensed as sanitary landfill in Old Fill Area by WDNR, to be operated by WMWI				
1977	Old Fill Landfill closes and Southeast Fill Area permitted by WDNR to operate as non-hazardous landfill				
1980	Southeast Fill Landfill closes				
1982	Sampling begins of residential private water supply wells by WMWI				
September 1983	U.S. EPA proposes Muskego Sanitary Landfill Site for NPL				
September 1984	NPL final listing for the Muskego Sanitary Landfill Site				
1986	WMWI and City of Muskego begin public water supply to residents				
August 1987	Consent Order signed by U.S. EPA with WMWI to initiate RI/FS				
January 1991	U.S. EPA issues UAO to WMWI for Site drum removal				
June 1992	Source Control (OU1) ROD signed by U.S. EPA.				
December 1992	U.S. EPA issues UAO to multiple parties for Source Control ROD				
February 1995	Site Groundwater (OU2) ROD signed by U.S. EPA				
June 1995	U.S.EPA issues UAO to multiple parties for Site Groundwater ROD				
September 1997	Site remedy construction completion report.				
August 1999	First five-year review completed				
June 1999	Municipal water supply to additional residents begins				
September 2004	Second five-year review completed				
August 2009	Third five-year review completed				
September 2010	Site ESD signed				
July 2011	Site CD entered				

B. BACKGROUND

Physical Characteristics

The Muskego Sanitary Landfill Site (Site) includes a former landfill area which occupies approximately 60 acres and is located north of Janesville Road (State Highway 24) and east of Crowbar Road in the City of Muskego, Wisconsin (See Figure 1). The Site is surrounded within one mile by industrial, commercial, residential and some agricultural properties. Located directly north of the Site is a closed landfill named Stone Ridge which is operated by Waste Management of Wisconsin (WMWI), and located west of the Site is a sand and gravel pit currently operated by the Payne & Dolan Company.

Hydrology

Groundwater flow away from the Site occurred in the sand and gravel units and was predominantly along the southern and southeast flow paths. The leachate movement away from the Old Fill Area may occur directly into the sand and gravel aquifer where no confining layer is present, through the confining material where present at the base of the refuse, or horizontally through the refuse to the edge of the confining layer and then down into the outwash sand and gravel aquifer. Groundwater in this area flowed along the southern flow path within the outwash sands and gravels.

Land and Resource Use

The Site predominately consists of a 60 acre closed covered and maintained landfill area, which can be historically divided into three major landfill sections: the Old Fill Area, the Southeast Fill Area, and the Non-Contiguous Fill Area. The Site also includes some areas where unacceptable levels of groundwater contamination from the landfill came to be located. The Old Fill Area portion of the Site consists of approximately 40 acres and was licensed as a sanitary landfill by WDNR in 1971. The area was originally used as a sand and gravel pit operation, until the property owner at the time, Alfred Wauer, received a public dump permit in 1954 from the Town of Muskego. ACME Disposal Service Corporation began operating the Site landfill in 1969, and then WMWI continued operation of the Site after a merger in 1971. The Old Fill Area was closed and covered in 1977. The Southeast Fill Area occupies approximately 16 acres directly east of the Old Fill Area. It is an engineered non-hazardous landfill which was permitted to operate by WDNR in 1977 after the Old Fill Area closed. The Southeast Fill Area operated from 1977 to 1980 and was then closed and covered. The Non-Contiguous Fill Area occupies approximately four acres of the 60 acre Site and is located directly east and northeast of the Old Fill Area. The Non-Contiguous Fill Area historically contained a buried drum trench area, two

refuse trench areas which contained several crushed drums in the refuse, and an L-shaped refuse area which contained fill material.

A portion of the Site in the four acre Non-Contiguous Fill Area was also historically utilized as an animal carcass transfer station and rendering plant. The former Muskego Rendering Plant and the Anamax Facility operated under a WDNR licensed wastewater treatment system that at various times included unlined seepage lagoons, treatment lagoons, an aeration pond, and two wastewater discharge ponds. These treatment systems operated from the early 1970s until 1984. After closing of the treatment system operations, the liquids, solids and associated soils were removed from these abandoned seepage lagoons according to WDNR guidelines in 1987.

History of Contamination

The Old Fill Area of the Site prior to being licensed as sanitary landfill in 1971 was noted as allegedly accepting some waste oil and paint product liquid wastes as part of a drum salvage operation, based on a Site inspection by WDNR. The specific types and quantities of refuse deposited in the 40 acre Old Fill Area after being permitted in 1971 and until it closed in 1977 were listed as undocumented, although they are believed to be primarily municipal refuse materials based on boring logs from the area. The two wastewater discharge ponds which operated until 1984 were located within the Old Fill Area. Although much of the Old Fill Area is underlain by till and clay composite material deposits, portions of the area are underlain by higher permeability sand and gravel deposits which provide a potential groundwater contaminant migration route. In addition, refuse deposit levels in portions of the Old Fill Area exist at or below the water table as it was placed there following previous excavations from the sand and gravel pit operation. The 16 acre Southeast Fill Area was documented to contain approximately 800,000 cubic yards of non-hazardous waste refuse, and test pit permeability tests indicate that the clay lining of the engineered landfill was at least five feet thick and had a permeability of at least 1x10 ⁻⁶ cm/sec.

The two refuse trenches in the four acre Non-Contiguous Fill Area contained 18 to 35 ft. depths of municipal waste materials, and some crushed and empty drums. The L-shaped refuse area in the Non-Contiguous Fill Area contained municipal refuse materials in thickness between 14 and 20 feet mixed with large amounts of soil. In 1988, geophysical surveys and test pits during the remedial investigation revealed a drum trench containing a concentration of buried drums with waste materials in the Non-Contiguous Fill Area of the Site, which measured approximately 10 ft. wide, 150 ft. long and 15 ft. deep. Underlain soils in the Non-Contiguous Fill Area vary consisting of sand, gravel, silt and clay, and provide a potential contaminant migration route for groundwater.

The former Muskego Rendering Plant and Anamax Facility seepage lagoons, treatment lagoons and wastewater ponds would have provided a potential groundwater contaminant migration

pathway between the time they began operation in the early 1970s until their excavation, cleaning and abandonment in 1987. The possibility of residual materials remaining at the Site after abandonment of the lagoons and wastewater ponds would also be considered as a potential source of contamination.

Initial Response

In response to deteriorating water quality in off-site groundwater monitoring wells, sampling of private wells downgradient of the Site was conducted in 1982 by the Site landfill operator WMWI and WDNR. The results of these water quality analyses indicated that local off-site wells might be impacted by contaminants emanating either from the Site landfill or the Muskego Rendering Plant wastewater seepage lagoons. Specifically, three private wells south of the Site along Janesville Road were identified as having potential impacts to groundwater quality and were supplied bottled water by WMWI. In 1983, after a deep replacement well was installed by WMWI, the three residences were provided connections to this alternative water supply.

Four additional private well sampling events occurred east and south of the Site in 1984 by WMWI and the Muskego Rendering Company under the direction of WDNR. As a result of these sampling events and concern over a number of residential private wells near the Site, WMWI and the City of Muskego agreed to extend municipal water supply to nearby residents east and south of the Site. The municipal water line extension was completed in 1986, as noted in the 1992 Remedial Investigation Report, which lists approximately 20 locations along Hillendale Dr, Janesville Rd and Crowbar Rd who were connected to municipal water and had previously utilized private wells for their source of water. A number of these residents chose not to abandon their private wells after receiving potable municipal water, utilizing the wells for purposes such as lawn watering. Residential wells which were not abandoned were often included and sampled under the ongoing Site operation & maintenance program.

Through a Unilateral Administrative Order (UAO) issued by U.S. EPA in January 1991, WMWI proceeded with a removal action during April and May 1991 in the drum trench located in the Non-Contiguous Fill Area. The removal action consisted of excavation of a total of 989 55-gallon waste material drums and approximately 2500 cubic yards of surrounding soils. Liquids in the drums and contaminated soils contained a number of volatile organic compounds (VOCs) including benzene, toluene, trichloroethene, tetrachloroethene and vinyl chloride. The drums and surrounding soils were excavated down to a depth of approximately 25 feet below the original surface elevation until groundwater was encountered. The excavated materials were then separated into drum liquids, drum solids, bulk soils and empty drums, and then were tested and transported to various approved off-site treatment and disposal facilities. This separation, testing and off-site disposal process was completed in April 1992.

Basis for Taking Action

Remedial planning began as the Muskego Sanitary Landfill Superfund Site was proposed for the National Priorities List (NPL) on September 8, 1983. The Site became a final NPL listing on September 21, 1984.

In August 1987, U.S. EPA and WDNR signed an Administrative Order by Consent with WMWI to conduct a Remedial Investigation (RI)/ Feasibility Study (FS) at the Site. The purpose of the RI was to identify sources of contamination, to characterize the contamination at the Site, and to characterize the current and potential threat to public health and the environment associated with the Site.

To focus and expedite cleanup of the Site, the project was divided into two operable units; the source control operable unit (SCOU, OU1) and the groundwater operable unit (GWOU, OU2). The SCOU focused on containing and removing contaminants which remained in on-site soil areas, to minimize any further spread of contamination. The GWOU focused on identifying, containing and treating groundwater contamination associated with the Site. Since the VOC groundwater contamination for areas outside the Site boundary was predominantly below the U.S. EPA MCL, the concern of potential downgradient vapor intrusion to soil was not an issue.

The RI/FS process for the SCOU was concluded in June 1992, while the RI/FS for the GWOU was concluded in February 1995.

Findings of the SCOU RI/FS:

The 60 acre landfill area was divided into three areas which consisted of the closed 40 acre Old Fill Landfill Area, the closed 16 acre Southeast Fill Area, and the 4 acre Non-Contiguous Fill Area. The Non-Contiguous Fill Area included a buried drum trench area, two refuse trench areas, an L-shaped refuse area, and the location of a historical animal carcass transfer station and rendering plant.

Several closed depressions on the clay cap existed within the Old Fill Area. These depressions were formed by settling of the refuse materials. An unquantified amount of surface water runoff periodically collected in these depressions and seeped into the landfill cover.

The waste material within the Old Fill Area was comprised mainly of municipal refuse. The site allegedly accepted liquid wastes prior to the 1970s. The average thickness of the refuse material was 30 feet.

The Old Fill Area was underlain primarily by clay till, lacustrine clay, peat, and gravel washing fines. The western portion of the fill was underlain by sand and gravel.

The Southeast Fill Area was an engineered, non-hazardous, zone of saturation landfill approved by the WDNR in 1977.

The Southeast Fill Area had a leachate collection network consisting of horizontal perforated pipes that drained to four leachate riser pipes. The landfill cap was documented to have a minimum of six inches of vegetated topsoil and 24 inches of clay cover. A decreasing trend in leachate elevations within the Southeast Fill Area risers had been observed since periodic leachate extraction began in 1981.

During the removal action in the Non-Contiguous Fill Area approximately 1000 drums and 2500 cubic yards of contaminated soil were removed. The soil sampled within the trench consisted of clay material with traces of fine sand, gravel, and silt.

The north and south refuse trenches in the Non-Contiguous Fill Area each contained 18 to 35 feet of refuse materials, and the L-shaped fill area refuse ranges in thickness from 14 to 20 feet.

The rendering plant seepage lagoons operated from the early 1970s to 1984, and accepted approximately 25,000 gallons per day of condensate and wastewater.

Leachate sample results indicated ketones and BTEX compounds as the predominant organic groups. Chlorinated ethenes and ethanes were less frequently detected and generally at lower concentrations. Semi-volatile compounds were also detected in leachate samples: phenols, chlorinated benzenes, PAHs, and phthalates were the predominant organic groups.

The inorganic character of the samples were for the most part typical of municipal landfill leachate, although somewhat higher levels of lead, copper, zinc, chromium, and cadmium were noted in some samples.

BTEX compounds and ketones were the predominant organic compound groups detected in the basal soil samples and the leachate head well borings.

Findings of the GWOU RI/FS:

Groundwater flow away from the Site occurred in the sand and gravel units and was predominantly along the southern and southeast flow paths.

VOCs were the predominant site-related constituents detected in groundwater from the southern and southeast flow paths. Concentrations of VOCs were generally low (less than 10 ug/L). Chlorinated ethenes and ethanes were most frequently detected.

Samples from wells located in the Non-Contiguous Fill Area showed the greatest site-related effects on groundwater, particularly beneath the L-shaped fill area.

Wells located along the northern boundary of the Old Fill Area indicated little if any site-related impacts.

Groundwater monitoring well results from the Site 1992 RI report indicated Wisconsin Enforcement Standard (ES) exceedances for 7 contaminants and U.S. EPA MCL exceedances for 8 contaminants. The compounds which exceeded the Wisconsin ES were the VOCs tetrachloroethene, vinyl chloride, 1,2-dichloroethane, trichloroethene, and benzene; and the inorganics selenium and cadmium. Compounds with an exceedence of the MCL included the VOCs listed above with the exception of tetrachloroethene, as well as thallium, cadmium, pentachlorophenol, and dichloropropane.

The leachate movement away from the Old Fill Area may occur directly into the sand and gravel aquifer where no confining layer is present, through the confining material where present at the base of the refuse, or horizontally through the refuse to the edge of the confining layer and then down into the outwash sand and gravel aquifer. Groundwater in this area flowed along the southern flow path within the outwash sands and gravels.

Contaminants released from the Non-Contiguous Fill Area entered the outwash sands and gravels and travel toward the southeast, south, and southwest. The continuous, but relatively thin outwash sand and gravel aquifer extending southward and eastward away from the Site, may be a significant migration pathway. However, the thick clay till east of the Site may restrict vertical migration of contamination within the upper outwash sands and gravel, thus limiting downward migration of contaminants into the deeper sand and gravel aquifer.

The evaluation of Chloride concentrations over the Site was performed to provide an indication of the effect of advection and dispersion on groundwater contaminants. Dilution appears to be substantial along the southern flow path. Substantial dilution of chloride also occurs along the southeast flow path in the upper and lower sand and gravel aquifers.

Exposure routes of concern at the site included the potential for contaminated groundwater to move toward residences, unacceptable exposure to landfill gas through methane migration in soils or VOC migration in air, inhalation of landfill gas, and future direct exposure to contaminated soil or waste if the existing landfill cap is not maintained. Conclusions of the risk assessment showed that it was unlikely any adverse effects to aquatic invertebrates, birds and mammals, livestock, and sensitive species have occurred. In addition, based on completion of the SCOU remedy it was also very unlikely that any future adverse effects would occur.

U.S. EPA, with WDNR assistance, completed a Record of Decision (ROD) in June of 1992 that outlined a Site remedy for the SCOU, and the two agencies completed a ROD in February 1995 outlining the Site GWOU remedy. The 1992 and 1995 RODs list a summary of the Site characteristics and nature and extent of contamination in section V of the documents. A corresponding Remedial Design/ Remedial Action (RD/RA) UAO for the SCOU ROD was

issued by U.S. EPA to multiple parties in December of 1992, and a corresponding RD/RA UAO for the GWOU ROD was issued by U.S. EPA to multiple parties in June of 1995.

C. REMEDIAL ACTIONS

Remedy Selection

The remedial response actions outlined by U.S. EPA for the Muskego Sanitary Landfill Site have included the June 1992 SCOU ROD, the February 1995 GWOU ROD, and the 2010 Site Explanation of Significant Differences (ESD).

1992 SCOU ROD Components:

- Deed restrictions and site controls that prevent access, excavation, and disturbance of the cap and installation of water supply wells;
- Fence extension to contain areas not enclosed by currently existing fences;
- Cap installation over the portions of the site deemed necessary in the ROD according to Wisconsin Administrative Code NR 504 standards;
- Installation or upgrade of landfill leachate control systems at the site;
- Active landfill gas control and monitoring for the site;
- In-Situ (In place) Soil Vapor Extraction at portions of the Non-Contiguous Fill Area of the site;
- Groundwater monitoring of selected existing monitoring and private wells to be determined during the remedial design; and
- Operation and Maintenance of all systems.

Remedial action objectives for the Site SCOU remedy are to provide adequate protection of human health and the environment by containing and maintaining waste material beneath the landfill cap, while limiting the potential for the release of contaminants to the ambient air, subwaste soils, and the groundwater; to minimize the migration of constituents by leachate to groundwater that would contribute to concentrations in excess of U.S. EPA MCLs and Wisconsin ES and Preventative Action Limit (PAL) standards according to NR 140; to control risk of seepage, migration and concentration of landfill gas generated by the Old Fill, Southeast Fill, and Non-Contiguous Fill Areas through treatment and/or engineering controls; and to minimize the potential for human exposure to waste and contaminated soils.

The SCOU ROD was presented as an interim remedial action, as an additional GWOU ROD was planned to address remedial action performance objectives for groundwater contamination associated with the Site.

1995 GWOU ROD Components:

- Monitor groundwater throughout the site;
- Conduct groundwater pumping test(s);
- Install and operate groundwater extraction in the vicinity of the Non-Contiguous Fill Area;
- Perform on-site treatment and discharge of extracted groundwater from the Non-Contiguous Fill Area;
- Discharge treated water to an on-site infiltration basin in accordance with state standards;
- Dispose of treatment residuals, if generated, to an approved disposal facility;
- Monitoring and evaluation of the effectiveness of the groundwater extraction system in achieving progress toward cleanup standards; and
- Expansion of the system if data on the performance of the system indicates that expansion is necessary to make progress toward cleanup standards.

Remedial action objectives for the Site GWOU remedy are reduction of the migration of contaminants of concern in groundwater at and beyond the Site waste boundaries in order to meet U.S.EPA MCLs, and State of Wisconsin ES and PAL standards according to NR 140;

returning groundwater associated with the Site to beneficial use wherever practicable; and further evaluation of the groundwater and plume characteristics associated with the Site.

An ESD was signed in September 2010. Changes to the remedy documented in this ESD are outlined below. All remedial action objectives pertaining to the RODs remain in place.

Changes to Remedy Do	cumented in 2010 ESD		
Remedy Component in 1992 ROD and 1995 ROD	Change in Remedy Being Documented 2010 ESD		
Deed restrictions and Site controls that prevent access, excavation, and disturbance of the cap and installation of water supply wells	Upgrade existing controls as necessary and add additional institutional controls needed for maintaining and monitoring areas potentially impacted by groundwater contamination associated with the Site		
Fence extension to contain areas not enclosed by currently existing fences	No change		
Cap installation over the portions of the Site deemed necessary in the ROD according to Wisconsin Administrative Code NR 504 standards	No change		
Installation or upgrade of landfill leachate control systems at the Site	No change		
Active landfill gas control and monitoring for the Site	No change		
In-Situ (In place) Soil Vapor Extraction at portions of the Non-Contiguous Fill Area of the Site	No change		
Groundwater monitoring of selected existing monitoring and private wells to be determined during the remedial design	No change		
Operation and Maintenance of all systems	No change		
Monitor groundwater throughout the Site	No change		

Changes to Remedy Do	Changes to Remedy Documented in 2010 ESD				
Remedy Component in 1992 ROD and 1995 ROD	Change in Remedy Being Documented in 2010 ESD				
Conduct groundwater pumping test(s)	No change				
Install and operate groundwater extraction in the vicinity of the Non-Contiguous Fill Area	No change				
Perform on-site treatment and discharge of extracted groundwater from the Non- Contiguous Fill Area	No change				
Discharge treated water to an on-site infiltration basin in accordance with state standards	No change				
Dispose of treatment residuals, if generated, to an approved disposal facility	No change				
Monitoring and evaluation of the effectiveness of the groundwater extraction system in achieving progress toward cleanup standards	Addition of evaluation of the performance of the components of the Site remedy in achieving the remedial action objectives and an upgrade/optimization of remedy components based on the evaluation.				
Expansion of the system if data on the performance of the system indicates that expansion is necessary to make progress toward cleanup standards	Addition of groundwater MNA evaluation (and contingent measures if necessary) to the remedy at the Site. Downgradient private wells have been replaced with municipal water supply in areas where groundwater contamination has been detected. Old deep wells previously used for industrial purposes adjacent to the landfill have been closed and abandoned to avoid interference with the on-site extraction system.				

Remedy Implementation

SCOU Remedy:

The RD/RA UAO for the 1992 ROD was issued by U.S. EPA to 46 potentially responsible parties (PRPs) in December of 1992. Required actions under this UAO included the design and installation of a two foot clay cap over the waste areas; expanding the existing leachate and gas extraction system with effluent flare over the entire Site waste areas; constructing an in-situ soil vapor extraction system (SVE) in portions of the Non-Contiguous Fill Area which included the 1991 drum removal; Site operation and maintenance (O&M); and ongoing groundwater monitoring until a final remedy addressing groundwater was implemented.

The remedial design for the SCOU work was completed and approved in October 1993, and SCOU remedial action activities began that same month. Prior to the construction of the clay cap, several buildings from the Anamax Rendering facility were demolished with the debris consolidated in the on-site fill areas. The entire SCOU construction project was completed in October 1994 with minor field modifications that included the removal of an underground storage tank and approximately fifteen buried drums. Full-time operation of the dual extraction wells for leachate and landfill gas began in November 1994.

GWOU Remedy:

The RD/RA UAO for the 1995 ROD was issued by U.S. EPA to 56 PRPs in June of 1995. Required actions under this UAO included the pilot testing, design and construction of a groundwater extraction and treatment system addressing contamination within the Non-Contiguous Fill Area; operation, maintenance and monitoring of the groundwater extraction system and discharge from the treatment system; and an expanded groundwater monitoring network to evaluate the trend of contaminants in groundwater associated with the Site, in order to provide adequate protection of human health and the environment.

A pilot study system was designed and installed as part of the GWOU remedial design in order to assist in developing well locations and pumping rates. This pilot study was conducted from August 1996 through February 1997. During the study three groundwater extraction wells were installed along the eastern Site boundary, as well as observation wells, in order to evaluate the radius of influence and contaminant concentrations. In May 1997 three soil borings were taken southeast of the Non-Contiguous Fill Area to supplement existing data on the local geologic formation.

The information from the pump test and soil borings was utilized to determine the optimal location for the groundwater system extraction and observation wells. Results from the pilot test showed sufficient capture in groundwater associated with the Non-Contiguous Fill Area using three extraction wells. Sampling results from the groundwater extraction system revealed that

Muskego municipal discharge limits were being met, and as a result the system was able to be discharged into the sanitary sewer system without additional treatment. A Site remedy construction completion report was completed by and signed by U.S. EPA in September 1997, and a remedial action implementation report was completed in March 1998.

A CD was entered in the Eastern District Court of Wisconsin in July 2011. Under this CD, the PRPs agreed to continue to conduct the components of the RD and RA at the Muskego Sanitary Landfill Site under the two RODs and the Site ESD. A two year MNA evaluation with additional monitoring well locations has taken place between 2012 and 2014, and MNA has been incorporated as a groundwater remedy at the Site.

System Operation/Operation and Maintenance

The monitoring programs for the Site landfill areas were detailed in the 1993 Final Remedial Design Report and updated in the 2012 O&M Plan. The landfill cover, leachate/landfill gas extraction wells, knockout sumps, the SVE and landfill gas blower/flare system, and Site ICs and access are inspected on a semiannual basis. The landfill cover system includes 33 gas extraction wells, 30 gas/leachate dual extraction wells, and 10 perimeter gas monitoring probes. The Site landfill gas and SVE effluent is sampled monthly. Effluent results from the three Site groundwater extraction wells and the separated leachate from the 30 leachate/landfill gas extraction wells are reported to the WDNR and the Milwaukee Metropolitan Sewerage District.

Operation and maintenance groundwater monitoring at the Site was originally detailed in the 1997 Sampling and Analysis Plan, and updated in the 2012 O&M Plan. The program included various quarterly, semi-annual and annual sampling of a group of monitoring wells close to the perimeter of the Site boundary. Three groundwater extraction wells were also sampled under the program, and periodic sampling of nearby private wells occurred. Private well sampling in 1997 and 1998 revealed vinyl chloride levels between 0.2 and 2.8 ug/L, and resulted in additional municipal water line extensions to residences south and east of the Site beginning in 1999. As a result, a number of private wells began to be sampled as part of the operation and maintenance program to assess any future need for an alternative water supply. Additional residences were supplied to municipal water through 2004, bringing the total to approximately 80 residences who were supplied public water since the initial hookups began in 1986. Expansion of municipal water in the area has made this service available to those residents closest to the Site, including locations approximately ½ mile to the south.

As a result of the concern over groundwater quality beyond the original Site monitoring program, an Expanded Groundwater Monitoring Work Plan (EGMWP) was completed in 2005 which required the installation of 10 additional groundwater monitoring wells generally east and southeast of the Site. Then in 2007, an Expanded Groundwater Monitoring Phase 2 Work Plan was completed requiring installation of another group of approximately 12 monitoring wells

located southwest, south, southeast and east of the Site. Additional monitoring of a deep aquifer municipal well approximately one mile east of the Site also began under an agreement between the PRPs and the City of Muskego. Some disagreements over interpretation of the Site monitoring program occurred between U.S. EPA and the Site PRPs during the years when the EGMWP and Phase 2 EGMWP were being completed and implemented. These disagreements resulted in negotiations at the Site involving the evaluation and incorporation of MNA and additional monitoring locations for the groundwater remedy, an evaluation of the components of the source control remedy, and implementation of any necessary improvements to the Site remedies based on those evaluations.

Current annual O&M costs at the Muskego Sanitary Landfill Site include the groundwater monitoring, SVE, landfill gas, leachate & landfill operation and maintenance, sampling, lab analysis, reporting, and Site inspections by U.S. EPA and WDNR. Additional Site investigations and reporting have occurred. Total estimated annual O&M costs since the last FYR have approximately ranged from \$200,000-\$500,000 per year.

APPENDIX B

1993 DEED RESTRICTION IC (RECORDED) SPECIAL CASING REQUIREMENTS

NOTICE OF ADMINISTRATIVE ORDER AND DEED RESTRICTION

1801281

Carl Wauer, the owner of record of two parcels known as the Muskego Landfill site and described in Exhibit A, attached hereto, which are subject to Administrative Order for Remedial Design and Remedial Action, U.S. EPA Docket No. V-W-92-C-173, issued December 9, 1992, hereby gives notice of said order, a copy of which is attached hereto as Exhibit P. Moreover, Carl Wauer hereby makes the following declarations as to limitations, restrictions and uses to which the parcels may be put and further hereby specifies that it is intended that such declarations run with the land as provided by law and be binding on all parties claiming under Carl Wauer.

The following shall be prohibited on the above-referenced land:

- 1. The installation of any drinking water wells;
- 2. Any use of, or activity, that may interfere with the work to be performed at the Muskego Landfill site as required by the above-referenced Administrative Order (Exhibit B); and
- 3. Any residential or commercial use, including but not limited to any filling, grading, excavating, building, drilling, mining, farming, or other development, except with the approval of U.S. Environmental Protection Agency, in consultation with the State, as consistent with the requirements of the above-referenced Administrative Order (Exhibit B).

Dated at Milwaukee, Wisconsin this 5th day of January, 1993.

Carl Waver Carl Waver, Owner

STATE OF WISCONSIN

MILWAUKEE COUNTY)

1801281

Personally came before me this 5th day of January, 1993, the abovenamed Carl Wauer to me known to be the person who executed the foregoing instrument and acknowledged the same.

Subscribed and sworn to before me

day of January, 1993

Alyce A Manthey Notary Pholic, State of Wisconsin My commission expires: 7/0/44

This instrument was prepared by:

Attorney Barry R. White

REGISTER'S OFFICE WAUKESHA COUNTY, WIS & SS

93 JAN -6 PM 3: 40

REERIH 1627445 0926

REGISTER OF DEEDS

PARCEL 1

A parcel of land located in Section 18, Town 5 North, Range 20 East, City of Muskego, County of Waukesha, State of Wisconsin, more particularly described as follows:

Commencing at the north 1/4 of section 18; thence south 87° , 20° 04" west, 1,325.95 ft.; thence south 01° , 11° 25" east, 2,245.29 ft. to the point of the beginning; thence north 47° , 48° 35" east 1,360.00 ft.; thence south 35°, 11° 25" east 320.00 ft.; thence south 21° , 18° 35" east 250.00 ft.; thence south 23° , 30° 24" east 190.80 ft.; thence south 87° , 29° 36" west 546.04 ft.; thence south 00° , 36° 30" east 730.12 ft.; thence south 13° , 21° 15" west 450.84 ft.; thence south 20° , 26° 54" east 520.00 ft.; thence south 87° , 26° 5" west 698.50 ft.; thence north 04° , 07° 54" west 1,000.55 ft.; thence north 40° , 33° 05" east 400.00 ft.; thence north 01° , 11° 25" west 183.55 ft. to the point of the beginning.

PARCEL II

A parcel of land located in Section 18, Town 5 North, Range 20 East in the City of Muskego, County of Waukesha, State of Wisconsin, more particularly described as follows:

Commencing at the north 1/4 of section 18; thence south 01°, 6' 54" east 1,324.58 ft.; thence north 87°, 29' 06" east 174.28 ft.; thence south 00°, 05' 54" east 1,332.00 ft.; thence south 02°, 3' 54" east 140 ft. to the point of the beginning; thence south 87°, 29' 36" west 850 ft.; thence south 13°, 21' 15" west 450.84 ft.; thence south 20°, 26' 54" east 520.00 ft.; thence south 00°, 26' 54" east 413.39 ft.; thence north 71°, 13' 37" east 549.75 ft.; thence north 02°, 52' 25" west 217.11 ft.; thence north 71°, 13' 37" east 208.55 ft.; thence south 02°, 52' 25" east 217.11 ft.; thence north 71°, 13' 37" east 39.97 ft.; thence south 01°, 06' 54" east 29.20 ft.; thence north 56°, 47' 06" east 62.43 ft.; thence north 02°, 03' 54" west 1,115.26 ft. to the point of the beginning.

COUNTY	LOCATION	CONTAMINANT	CASING REQUIREMENTS
Waukesha	City of Muskego – East Part (Muskego Landfill)	VOCs	Recommended:
01/2004	T5N, R20E		Connection to municipal water system.
Area 67a	- Section 17		Required:
	- SW¼ and NW¼ of the NW¼		1. Contact the WDNR Southeast Region Office for
•	- SW¼ and NW¼ of the SW¼		updated construction requirements.
	- Section 18		2. Any new water supply well constructed or an
	- SW¼ and SE¼ of the NE¼	-	existing water supply well reconstruction shall be
	- SE¼ and SW¼ of the SW¼	1.	sampled upon completion and tested for volatile
	- The entire SE¼		organic compounds (VOCs) using EPA Method
	- Section 19		502.2 or 524.2 and the results sent to the DNR
	- NE¼ of the NE¼		Southeast Region Office.
	- NW¼ of the NE¼	1.	
	- N½ of the SE¼ of the NE¼		
	- N½ of the SW¼ of the NE¼		
	- NE% of the NW %		·
Waukesha	City of Muskego – East Part (Muskego Landfill)	VOCs	Recommended:
01/2004	T5N, R20E		1. Any new water supply well constructed or an
Area 67b	- Section 17		existing water supply well reconstruction shall be
	- NE14, SW14 and SE14 of the SW14		sampled upon completion and tested for volatile
	- NE¼, NW¼ and SE¼ of the NW¼		organic compounds (VOCs) using EPA Method
	- Section 18		502.2 or 524.2 and the results sent to the DNR
	- NE¼ and NW¼ of the NE¼		Southeast Region Office.
	- Section 19		2. Contact the WDNR Southeast Region Office for
	- S½ of the SE¼ of the NE¼		updated construction recommendations.
	- S½ of the SW¼ of the NE¼		
	- SE ¹ / ₄ , NW ¹ / ₄ and SW ¹ / ₄ of the NW ¹ / ₄	, i	
	- NE¼ of the SW¼		
	- NW¼ and NE¼ of the SE¼		
	- Section 20		,
	- NW¼ and SW¼ of the SW¼		
	- NW¼ of the SW¼		
Waukesha	Town of Pewaukee (Hill 'n Dale Subdivision - High & Creviced Bedrock Area)	Bacteria	135 feet cement-casing required
11/08/63	T7N, R19E (Also see City of Brookfield)		
Area 57	- Section 12		
	- SE¼		·
	- S½ of the NE¼		•
	- Section 13		
	- N½ of the NE¼		
	(Also see Waukesha County, City of Brookfield for other segment of this area.)		

APPENDIX C

FIVE-YEAR STATE NOTIFICATION LETTER AND NEWSPAPER AD



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 5 77 WEST JACKSON BOULEVARD CHICAGO, ILLINOIS 60604

December 2, 2013

SR-6J

Jim Delwiche
Wisconsin Department of Natural Resources
141 NW Barstow Street, Room 180
Waukesha, WI 53188

Re: Notification of Five Year Review Start for the Muskego Sanitary Landfill Site

Dear Mr. Delwiche:

This letter is to notify you that the United States Environmental Protection Agency (EPA) has begun the process of the Five Year Review for the Muskego Sanitary Landfill Superfund Site in Muskego, Wisconsin. A Statutory Five Year Review for the Site will be conducted as required by Section 121 of CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA).

The Five Year Review for the Muskego Sanitary Landfill Site is due August 21, 2014, and we are providing you this notification so that EPA and the Wisconsin Department of Natural Resources (WDNR) can begin the necessary activities for the review process. A site inspection will be scheduled, and I am available to discuss any of the matters concerning the Site Five Year Review process.

Please contact me at 312-886-6552 if you have any questions or concerns regarding this Five Year Review for the Muskego Sanitary Landfill Site.

Sincerely

Jeff Gord

Remedial Project Manager

U.S. EPA

bcc:

Donald Bruce

Thomas Short Bonnie Eleder

Frances Koonce, WDNR

Sue Pastor, OPA

Tom Krueger, ORC



EPA To Review Muskego Sanitary Landfill Superfund Site

Muskego, Wisconsin

The U.S. Environmental Protection Agency is conducting a five-year review of the Muskego Sanitary Landfill Superfund site located on state Route 24 and Crowbar Road, Muskego, Waukesha County, Wis. The Superfund law requires regular checkups of sites that have been cleaned up or where cleanup has been ongoing for at least five years – with waste managed on-site – to make sure the cleanup continues to protect people and the environment. This is the fourth five-year review of this site.

EPA's cleanup of chemicals including vinyl chloride consisted of capping, fencing, controlling landfill gas and leachate, treatment of contaminated ground water, using in-place vapor extraction, implementing site controls, and monitoring.

More information is available at the Muskego Public Library, S73 W16663 Janesville Road and at www.epa.gov/region5/sites/muskego. The review should be completed by August 2014.

The five-year review is an opportunity for you to tell EPA about site conditions and any concerns you have. Contact:

Susan Pastor
Community Involvement Coordinator
pastor.susan@epa.gov
312-353-1325

Jeff Gore Remedial Project Manager gore.jeffrey@epa.gov 312-886-6552

You may also call EPA toll-free at 800-621-8431, 8:30 a.m. - 4:30 p.m., weekdays.

APPENDIX D

SITE MONITORING DATA

Table 1 Muskego Landfill Landfill Gas and Leachate Extraction Volume Summary January to March 2014

MONTH	LEACHATE VOLUME REMOVED (gailons)	LFG FLOW RATE ⁽¹⁾ (cfm)	METHANE CONCENTRATION ⁽¹⁾ (% by volume)
January	56,330	72	32
February	.57,510	96	35
March	102,010	192	32
Total Gallons	215,850		<u>. </u>
	Monthly Average	120	33

Footnotes:

(1) After wellfield monitoring values are used.

By: R. Wienkes 4/4/14 Checked by: 4/7/14

Table 4
Summary of MNA Monitoring VOCs
Muskego Sanitary Landfill
December 2013

		CW07 12/12/2013	E093P 12/11/2013	E099A 12/13/2013	E123B 12/13/2013	E135A 12/13/2013	E137B 12/12/2013	E141A 12/11/2013	MW-01 12/10/2013	MW-01A 12/10/2013
PARAMETER	UNITS	411022	411026	411020	411019	411016	411025	411027	411035	411034
1,1,1,2-TETRACHLOROETHANE	UG/L	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009
1,1,1-TRICHLOROETHANE	UG/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,2,2-TETRACHLOROETHANE	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
1,1,2-TRICHLOROETHANE	UG/L	. < 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
1,1-DICHLOROETHANE	UG/L	< 0.014	< 0.014	< 0.014	0.035 J	0.42	1 .	1.2	< 0.014	< 0.014
1,1-DICHLOROETHENE	UG/L	< 0.028	< 0.028	< 0.028	< 0.028	< 0.028	< 0.028	< 0.028	< 0.028	< 0.028
1,1-DICHLOROPROPENE	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
1,2,3-TRICHLOROBENZENE	UG/L	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024
1,2,3-TRICHLOROPROPANE	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
1,2,4-TRICHLOROBENZENE	UG/L	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018
1,2,4-TRIMETHYLBENZENE	UG/L	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009
1,2-DIBROMO-3-CHLOROPROPANE	UG/L	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07
1,2-DIBROMOETHANE	UG/L	< 0.021	· < 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021
1,2-DICHLOROBENZENE	UG/L	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
1,2-DICHLOROETHANE	UG/L	< 0.013	< 0.013	< 0.013	< 0.013	0.19	0.12	0.066	< 0.013	< 0.013
1,2-DICHLOROPROPANE	UG/L	< 0.016	< 0.016	< 0.016	< 0.016	0.12	0.14	0.49	< 0.016	< 0.016
1,3,5-TRIMETHYLBENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
1,3-DICHLOROBENZENE	UG/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
1,3-DICHLOROPROPANE	UG/L	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	.< 0.013	< 0.013
1,4-DICHLOROBENZENE	UG/L	< 0.013	< 0.013	< 0.013	< 0.013	0.17	< 0.013	< 0.013	< 0.013	< 0.013
2,2-DICHLOROPROPANE	UG/L	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021
2-BUTANONE	UG/L	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.75 J	· < 0.4	< 0.4	< 0.4
2-CHLOROTOLUENE	UG/L	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017
2-HEXANONE	UG/L	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
4-CHLOROTOLUENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
- 4-METHYL-2-PENTANONE	UG/L	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
ACETONE	UG/L	0.74 JBu	1.1 JBu	1.3 Bu	0.91 JBu	1.3 Bu	1.2 Bu	0.86 JBu	1.3 Bu	1.4 Bu
BENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	0.11	0.28	0.065	< 0.014	< 0.014
BROMOBENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
BROMOCHLOROMETHANE	UG/L	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026
BROMODICHLOROMETHANE	UG/L	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
BROMOFORM	UG/L	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022
BROMOMETHANE	UG/L	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019
CARBON DISULFIDE	UG/L	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	0.026 Ju	0.05 Ju	< 0.022	0.04 Ju
CARBON TETRACHLORIDE	UG/L	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018
CHLOROBENZENE	UG/L	< 0.011	< 0.011	< 0.011	< 0.011	0.28	0.089	< 0.011	< 0.011	< 0.011
CHLORODIBROMOMETHANE	UG/L	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017
CHLOROETHANE	UG/L	< 0.02	< 0.02	< 0.02	< 0.02	0.46	0.34	0.064 J	< 0.02	< 0.02

Table 4
Summary of MNA Monitoring VOCs
Muskego Sanitary Landfill
December 2013

,	•	CW07	E093P	E099A 12/13/2013	E123B 12/13/2013	E135A 12/13/2013	E137B 12/12/2013	E141A 12/11/2013	MW-01 12/10/2013	MW-01A 12/10/2013
PARAMETER	UNITS	411022	411026	411020	411019	411016	411025	411027	411035	411034
CHLOROFORM	UG/L	< 0.012	< 0.012	< 0.012	0.031 J	< 0.012	< 0.012	0.022 J	< 0.012	< 0.012
CHLOROMETHANE	UG/L	0.031 JBu	0.039 JBu	0.026 JBu	< 0.016	0.041 JBu	< 0.016	0.018 JBu	0.077 Bu	0.019 JB
CIS-1,2-DICHLOROETHENE	UG/L	< 0.012	< 0.012	< 0.012	0.05	8.0	1.1	2.8	< 0.012	< 0.012
CIS-1,3-DICHLOROPROPENE	UG/L	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017
DIBROMOMETHANE	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
DICHLORODIFLUOROMETHANE	UG/L	0.087 Bu	0.1 Bu	0.11 Bu	0.13 Bu	0.21 Bu	0.19 Bu	0.43 Bu	0.24 Bu	0.29 Bu
DI-ISOPROPYL ETHER	UG/L	< 0.016	< 0.016	< 0.016	< 0.016	0.061	0.072	0.041 J	< 0.016	< 0.016
ETHYLBENZENE	UG/L	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
FLUOROTRICHLOROMETHANE	UG/L	< 0.011	< 0.011	< 0.011	⁻ 0.012 J	< 0.011	0.02 J	0.025 J	< 0.011	< 0.011
HEXACHLOROBUTADIENE	UG/L	< 0.018 Zj	< 0.018 Zj	< 0.018 Zj	< 0.018 Zj	< 0.018 Zj	< 0.018 Zj	< 0.018 Zj	< 0.018 Zj	< 0.018 Zj
ISOPROPYLBENZENE	UG/L	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013
METHYLENE CHLORIDE	UG/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
METHYL-TERT-BUTYL-ETHER	UĠ/L	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021
NAPHTHALENE	UG/L	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022
N-BUTYLBENZENE	UG/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
N-PROPYLBENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
P-ISOPROPYLTOLUENE	UG/L	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
SEC-BUTYLBENZENE	UG/L	< 0.015	< 0.015	< 0.015	< 0.015 ⁻	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
STYRENE	UG/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
TERT-BUTYLBENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
TETRACHLOROETHENE	UG/L	< 0.011	< 0.011	< 0.011	0.37	< 0.011	< 0.011	0.17	< 0.011	< 0.011
TETRAHYDROFURAN	UG/L	< 0.38	< 0.38	< 0.38	< 0.38	0.57 J	1 J	< 0.38	0.53 J	0.86 J
TOLUENE	UG/L	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
TRANS-1,2-DICHLOROETHENE	UG/L	< 0.009	< 0.009	< 0.009	< 0.009	0.095	0.11	0.13	< 0.009	< 0.009
TRANS-1,3-DICHLOROPROPENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0:014	< 0.014	< 0.014	< 0.014	< 0.014
TRICHLOROETHENE	UG/L	< 0.015	< 0.015	< 0.015	0.31	< 0.015	0.097	1.4	< 0.015	< 0.015
VINYL ACETATE	UG/L	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15.	< 0.15	< 0.15	< 0.15	< 0.15
VINYL CHLORIDE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	0.23	0.49	0.098	1.2	5.1
XYLENE, M + P	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
XYLENE, O	UG/L	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009
XYLENE, TOTAL	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
1,2-DICHLOROETHENE, TOTAL	UG/L	< 0.012	< 0.012	< 0.012	0.05	0.895	1.21	2.93	< 0.012	< 0.012
TOTAL BTEX	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	0.11	0.28	0.065	< 0.023	< 0.023
TOTAL CHLORINATED ETHENES	UG/L	< 0.028	< 0.028	< 0.028	0.73	1.125	1.797	4.598	1.2	5.1
TOTAL CHLORINATED VOC	UG/L	< 0.07	< 0.07	< 0.07	0.808	2.765	3.506	6.465	1.2	5.1
TOTAL VOC	UG/L	< 0.4	< 0.4	< 0.4	0.808	3.506	5.608	6.571	1.73	5.979

Table 4
Summary of MNA Monitoring VOCs
Muskego Sanitary Landfill
December 2013

		MW-02 12/11/2013	MW-02 DUP 12/10/2013	MW-03 12/10/2013	MW-03A 12/10/2013	MW-08 12/10/2013	MW-08A 12/10/2013	MW-09 12/13/2013	MW-10 12/13/2013	MW-10 DUP 12/13/2013
PARAMETER	UNITS	411028	411040	411030	411031	411033	411032	411018	411017	411042
1,1,1,2-TETRACHLOROETHANE	UG/L	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009
1.1.1-TRICHLOROETHANE	UG/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,2,2-TETRACHLOROETHANE	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
1,1,2-TRICHLOROETHANE	UG/L	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
1,1-DICHLOROETHANE	UG/L	0.022 J	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
1,1-DICHLOROETHENE	UG/L	< 0.028	< 0.028	< 0.028	< 0.028	< 0.028	< 0.028	< 0.028	< 0.028	< 0.028
1,1-DICHLOROPROPENE	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
1,2,3-TRICHLOROBENZENE	UG/L	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024
1,2,3-TRICHLOROPROPANE	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
1,2,4-TRICHLOROBENZENE	UG/L	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018
1,2,4-TRIMETHYLBENZENE	UG/L	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009-	< 0.009	< 0.009	< 0.009
1,2-DIBROMO-3-CHLOROPROPANE	UG/L	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07
1,2-DIBROMOETHANE	UG/L	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021
1,2-DICHLOROBENZENE	UG/L	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
1,2-DICHLOROETHANE	UG/L	< 0.013	< 0.013	0.18	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013
1,2-DICHLOROPROPANE	ŲG/L	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016
1,3,5-TRIMETHYLBENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
1,3-DICHLOROBENZENE	UG/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
1,3-DICHLOROPROPANE	UG/L	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013
1,4-DICHLOROBENZENE	UG/L	< 0.013	< 0.013	< 0.013	< 0.013	· < 0.013	< 0.013	< 0.013	< 0.013	< 0.013
2,2-DICHLOROPROPANE	UG/L	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021
2-BUTANONE	UG/L	< 0.4	< 0.4	0.71 J	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
2-CHLOROTOLUENE	UG/L	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017
2-HEXANONE	UG/L	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
4-CHLOROTOLUENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
4-METHYL-2-PENTANONE	UG/L	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
ACETONE	UG/L	1.5 Bu	1.3 Bu	0.92 JBu	1 JBu	1 JBu	0.99 JBu	1.5 Bu	1.3 Bu	1 JBu
BENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
BROMOBENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
BROMOCHLOROMETHANE	UG/L	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026
BROMODICHLOROMETHANE	UG/L	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
BROMOFORM	UG/L	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022
BROMOMETHANE	UG/L	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019
CARBON DISULFIDE	UG/L	< 0.022	0.025 Ju	< 0.022	0.11 u	0.022 u	0.022 и	0.033 Ju	< 0.022	< 0.022
CARBON TETRACHLORIDE	UG/L	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018
CHLOROBENZENE	UG/L	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
CHLORODIBROMOMETHANE	UG/L	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017
CHLOROETHANE	UG/L	< 0.02	< 0.02	0.41	< 0.02	< 0.02	< 0.02	0.14	< 0.02	< 0.02

Table 4
Summary of MNA Monitoring VOCs
Muskego Sanitary Landfill
December 2013

			MW-02	MW-02 DUP	MW-03	MW-03A	MW-08	MW-08A	MW-09	MW-10	MW-10 DUP
			12/11/2013	12/10/2013	12/10/2013	12/10/2013	12/10/2013	12/10/2013	12/13/2013	12/13/2013	12/13/2013
	PARAMETER	UNITS	411028	411040	411030	411031	411033	411032	411018	411017	411042
	CHLOROFORM	UG/L	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
	CHLOROMETHANE	UG/L	0.023 JBu	< 0.016	< 0.016	0.023 JB	< 0.016	< 0.016	0.03 JBu	0.04 JBu	0.039 JBu
	CIS-1,2-DICHLOROETHENE	UG/L	< 0.012	< 0.012	0.5	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
	CIS-1,3-DICHLOROPROPENE	UG/L	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017
	DIBROMOMETHANE	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
	DICHLORODIFLUOROMETHANE	UG/L	0.18 Bu	0.17 Bu	0.69 Bu	0.097 Bu	0.082 Bu	0.12 Bu	0.6 Bu	0.16 Bu	0.17 Bu
	DI-ISOPROPYL ETHER	UG/L	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016
	ETHYLBENZENE	UG/L	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
	FLUOROTRICHLOROMETHANE	UG/L	< 0.011	< 0.011	0.19	< 0.011	< 0.011	< 0.011	0.12	< 0.011	< 0.011
	HEXACHLOROBUTADIENE	UG/L	< 0.018 Zj	< 0.018 Zj	< 0.018 Z j	< 0.018 Z j	< 0.018 Z j	< 0.018 Zj	< 0.018 Zj	< 0.018 Zj	< 0.018 Z j
	ISOPROPYLBENZENE	UG/L	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013
	METHYLENE CHLORIDE	UG/L	< 0.1	< 0.1	< 0.1	< 0.1⋅	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	METHYL-TERT-BUTYL-ETHER	UG/L	<-0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021
	NAPHTHALENE	UG/L	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022
	N-BUTYLBENZENE	UG/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	N-PROPYLBENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
	P-ISOPROPYLTOLUENE	UG/L	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
	SEC-BUTYLBENZENE	UG/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
	STYRENE	UG/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	0.021 J	< 0.015	< 0.015
	TERT-BUTYLBENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
	TETRACHLOROETHENE	UG/L	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
	TETRAHYDROFURAN	ŲG/L	< 0.38	< 0.38	0.83 J	< 0.38	< 0.38	< 0.38	0.83 J	0.7 J	0.82 J
	TOLUENE	UG/L	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	0.02 J	< 0.012	< 0.012
	TRANS-1,2-DICHLOROETHENE	UG/L	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009
	TRANS-1,3-DICHLOROPROPENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
	TRICHLOROETHENE	UG/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
	VINYL ACETATE	UG/L	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
	VINYL CHLORIDE	UG/L	< 0.014	< 0.014	0.58	< 0.014	< 0.014	< 0.014	0.62	0.58	0.54
	XYLENE, M + P	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
	XYLENE, O	UG/L	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009
	XYLENE, TOTAL	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
						•					
	1,2-DICHLOROETHENE, TOTAL	UG/L	< 0.012	< 0.012	0.5	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
·	TOTAL BTEX	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	0.02	< 0.023	< 0.023
	TOTAL CHLORINATED ETHENES	UG/L	< 0.028	< 0.028	. 1.08	< 0.028	< 0.028	< 0.028	0.62	0.58	0.54
	TOTAL CHLORINATED VOC	UG/L	0.022	< 0.07	1.86	< 0.07	< 0.07	< 0.07	0.88	0.58	0.54
	TOTAL VOC	UG/L	0.022	< 0.4	3.4	0.023	< 0.4	< 0.4	1.73	1.28	1.36

Table 4
Summary of MNA Monitoring VOCs
Muskego Sanitary Landfill
December 2013

		MW-10A 12/9/2013	MW-11A 12/10/2013	MW-11A DUP 12/9/2013	MW-13A 12/16/2013	MW-18A 12/11/2013	MW-19A 12/13/2013	MW-20 12/9/2013	MW-22A 12/12/2013	MW-23A 12/13/2013
PARAMETER	UNITS	411037	411036	411039	411567	411029	411014	411038	411023	411015
1,1,1,2-TETRACHLOROETHANE	UG/L	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009
1,1,1-TRICHLOROETHANE	UG/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,2,2-TETRACHLOROETHANE	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
1,1,2-TRICHLOROETHANE	UG/L	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
1,1-DICHLOROETHANE	UG/L	< 0.014	< 0.014	< 0.014	0.5	1.5	0.07	< 0.014	< 0.014	< 0.014
1,1-DICHLOROETHENE	UG/L	< 0.028	< 0.028	< 0.028	< 0.028	0.059 J	< 0.028	< 0.028	< 0.028	< 0.028
1,1-DICHLOROPROPENE	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
1,2,3-TRICHLOROBENZENE	UG/L	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024
1,2,3-TRICHLOROPROPANE	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
1,2,4-TRICHLOROBENZENE	UG/L	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018
1,2,4-TRIMETHYLBENZENE	UG/L	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009
1,2-DIBROMO-3-CHLOROPROPANE	UG/L	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07
1,2-DIBROMOETHANE	UG/L	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021
1,2-DICHLOROBENZENE	UG/L	< 0.012	< 0.012	· < 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
1,2-DICHLOROETHANE	UG/L	< 0.013	< 0.013	< 0.013	< 0.013	0.074	0.051	< 0.013	< 0.013	< 0.013
1,2-DICHLOROPROPANE	UG/L	< 0.016	< 0.016	< 0.016	0.19	0.41	< 0.016	< 0.016	< 0.016	< 0.016
1,3,5-TRIMETHYLBENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
1,3-DICHLOROBENZENE	UG/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
1,3-DICHLOROPROPANE	UG/L	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013
1,4-DICHLOROBENZENE	UG/L	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013
2,2-DICHLOROPROPANE	UG/L	< 0.021	· < 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021
2-BUTANONE	UG/L	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.81 J	< 0.4	< 0.4	< 0.4
2-CHLOROTOLUENE	UG/L	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017
2-HEXANONE	UG/L	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
4-CHLOROTOLUENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
4-METHYL-2-PENTANONE	UG/L	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
ACETONE	UG/L	0.88 JBu	1.1 JBu	1.3 Bu	< 0.4	0.88 JBu	1.3 Bu	0.59 JBu	0.91 JBu	1.1 JBu
BENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	0.15	< 0.014	< 0.014	< 0.014	< 0.014
BROMOBENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
BROMOCHLOROMETHANE	UG/L	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026
BROMODICHLOROMETHANE	UG/L	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
BROMOFORM	UG/L	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022
BROMOMETHANE	UG/L	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019
CARBON DISULFIDE	UG/L	0.038 Ju	0.058 J u	0.047 Ju	< 0.022	0.025 Ju	0.091 u	< 0.022	0.028 Ju	0.031 Ju
CARBON TETRACHLORIDE	UG/L	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018
CHLOROBENZENE	UG/L	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
CHLORODIBROMOMETHANE	UG/L	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017
CHLOROETHANE	UG/L	< 0.02	< 0.02	< 0.02	< 0.02	0.17	0.21	< 0.02	< 0.02	< 0.02

Table 4
Summary of MNA Monitoring VOCs
Muskego Sanitary Landfill
December 2013

		MW-10A	MW-11A	MW-11A DUP	MW-13A	MW-18A	MW-19A	MW-20	MW-22A	MW-23A
PARAMETER	UNITS	12/9/2013 411037	12/10/2013 411036	12/9/2013 411039	12/16/2013 411567	12/11/2013 411029	12/13/2013 411014	12/9/2013 411038	12/12/2013 411023	12/13/2013 411015
 CHLOROFORM	UG/L	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
CHLOROMETHANE	UG/L	0.037 JBu	0.028 JBu	0.042 JBu	0.031 JBu	< 0.012	0.053 JBu	0.059 Bu	0.029 JBu	0.031 JBu
 CIS-1,2-DICHLOROETHENE	UG/L	< 0.012	< 0.012	< 0.012	0.59	7.6	5.4	< 0.012	< 0.012	< 0.012
CIS-1,3-DICHLOROPROPENE	UG/L	< 0.012	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.012	< 0.012	< 0.012
DIBROMOMETHANE	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
DICHLORODIFLUOROMETHANE	UG/L	0.13 Bu	0.1 Bu	0.098 Bu	0.23 Bu	0.12 Bu	0.41 Bu	0.11 Bu	0.1 Bu	0.14 Bu
DI-ISOPROPYL ETHER	UG/L	< 0.016	< 0.016	< 0.016	< 0.016	0.04 J	0.017 J	< 0.016	< 0.016	< 0.016
ETHYLBENZENE	UG/L	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	0.013 J	< 0.012	< 0.012	< 0.012
FLUOROTRICHLOROMETHANE	UG/L	< 0.011	< 0.011	< 0.011	0.022 J	< 0.011	0.039	< 0.011	< 0.011	< 0.011
HEXACHLOROBUTADIENE	UG/L	< 0.018 Zj	< 0.018 Zj	< 0.018 Z j	< 0.018 Zj	< 0.018 Zj	< 0.018 Z	< 0.018 Zj	< 0.018 Zj	< 0.018 Zj
ISOPROPYLBENZENE	UG/L	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013 [^]	< 0.013 [°]
METHYLENE CHLORIDE	UG/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
METHYL-TERT-BUTYL-ETHER	UG/L	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021
NAPHTHALENE	UG/L	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022
N-BUTYLBENZENE	UG/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
N-PROPYLBENZENE	UG/L	< 0.014	< 0.014	· < 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
P-ISOPROPYLTOLUENE	UG/L	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
SEC-BUTYLBENZENE	ÚG/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
STYRENE	UG/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
TERT-BUTYLBENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
 TETRACHLOROETHENE 	UG/L	< 0.011	< 0.011	< 0.011	0.11	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
TETRAHYDROFURAN	UG/L	< 0.38	< 0.38	< 0.38	< 0.38	< 0.38	1.1 J	< 0.38	. < 0.38	< 0.38
TOLUENE	UG/L	< 0.012	0.028 J	0.028 J	< 0.012	< 0.012	0.051	< 0.012	< 0.012	0.019 J
TRANS-1,2-DICHLOROETHENE	UG/L	< 0.009	< 0.009	< 0.009	0.051	0.24	0.064	< 0.009	< 0.009	< 0.009
TRANS-1,3-DICHLOROPROPENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
TRICHLOROETHENE	UG/L	< 0.015	< 0.015	< 0.015	2.4	13 Mj	< 0.015	< 0.015	< 0.015	< 0.015
VINYL ACETATE	UG/L	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
VINYL CHLORIDE	UG/L	0.035 J	< 0.014	< 0.014	0.064	0.8	5.3	< 0.014	< 0.014	0.054
XYLENE, M + P	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	0.025 J	< 0.023	< 0.023	< 0.023
XYLENE, O	UG/L	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009
XYLENE, TOTAL	UG/L	< 0:023	< 0.023	< 0.023	< 0.023	< 0.023	0.025	< 0.023	< 0.023	< 0.023
1,2-DICHLOROETHENE, TOTAL	UG/L	< 0.012	< 0.012	< 0.012	0.641	7.84	5.464	< 0.012	< 0.012	< 0.012
TOTAL BTEX	UG/L	< 0.012	0.028	0.028	< 0.023	7.8 4 0.15	0.089	< 0.012	< 0.012	0.012
TOTAL CHLORINATED ETHENES	UG/L UG/L	0.023	< 0.028	< 0.028	3.215	21.699	10.764	< 0.023	< 0.023	0.019
TOTAL CHLORINATED ETHENES	UG/L	0.035	< 0.028 < 0.07	< 0.028 < 0.07	3.215 3.927	23.853	,10.764 11.134	< 0.028 < 0.07	< 0.028 < 0.07	0.054
TOTAL CHLORINATED VOC	UG/L	0.035	0.028	0.028	3.927 3.927	24.043	13.15	< 0.07	< 0.07	0.054
TOTAL VOC	UG/L	1 0.035	0.020	0.020	3.921	24,043	13.15	< 0.4	< ∪,4	0.073

Table 4
Summary of MNA Monitoring VOCs
Muskego Sanitary Landfili
December 2013

		MW-24A 12/16/2013	P064C 12/13/2013	P067A 12/12/2013	P067A DUP 12/11/2013	TRIP BLANK 12/9/2013	TRIP BLANK 12/16/2013
PARAMETER	UNITS	411566	411021	411024	411041	411043	411568
1,1,1,2-TETRACHLOROETHANE	UG/L	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009
1,1,1-TRICHLOROETHANE	UG/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,2,2-TETRACHLOROETHANE	UG/L ,	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
1,1,2-TRICHLOROETHANE	UG/L	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
1,1-DICHLOROETHANE	UG/L	< 0.014	0.098	< 0.014	< 0.014	< 0.014	< 0.014
1,1-DICHLOROETHENE	UG/L	< 0.028	< 0.028	< 0.028	< 0.028	< 0.028	< 0.028
1,1-DICHLOROPROPENE	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
1,2,3-TRICHLOROBENZENE	UG/L	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024
1,2,3-TRICHLOROPROPANE	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
1,2,4-TRICHLOROBENZENE	UG/L	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018
1,2,4-TRIMETHYLBENZENE	UG/L	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009
1,2-DIBROMO-3-CHLOROPROPANE	UG/L	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07
1,2-DIBROMOETHANE	UG/L	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021
1,2-DICHLOROBENZENE	ÜG/L	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
1,2-DICHLOROETHANE	UG/L	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013
1,2-DICHLOROPROPANE	UG/L	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016
1,3,5-TRIMETHYLBENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
1,3-DICHLOROBENZENE	UG/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
1,3-DICHLOROPROPANE	UG/L	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013
1,4-DICHLOROBENZENE	UG/L	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013
2,2-DICHLOROPROPANE	UG/L	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021
2-BUTANONE	UG/L	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
2-CHLOROTOLUENE	UG/L	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017
2-HEXANONE	UG/L	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
4-CHLOROTOLUENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
4-METHYL-2-PENTANONE	UG/L	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
ACETONE	UG/L	0.98 JBu	0.82 JBu	3.1 Bu	0.61 JBu	1.6 B	1.4 B
BENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
BROMOBENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
BROMOCHLOROMETHANE	UG/L	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026
BROMODICHLOROMETHANE	UG/L	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
BROMOFORM	UG/L	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022
BROMOMETHANE	UG/L	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019
CARBON DISULFIDE	UG/L	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022
CARBON TETRACHLORIDE	UG/L	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018
CHLOROBENZENE	UG/L	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
CHLORODIBROMOMETHANE	UG/L	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017
	UG/L	< 0.017	0.19	< 0.02	< 0.02	< 0.02	< 0.02
CHLOROETHANE	UG/L	< 0.02	0.19	< 0.02	< U.UZ	₹ 0,02	V 0.02

Table 4
Summary of MNA Monitoring VOCs
Muskego Sanitary Landfill
December 2013

	PARAMETER	UNITS	MW-24A 12/16/2013 411566	P064C 12/13/2013 411021	P067A 12/12/2013 411024	P067A DUP 12/11/2013 411041	TRIP BLANK 12/9/2013 411043	TRIP BLANK 12/16/2013 411568
	CHLOROFORM	UG/L	< 0.012	< 0.012	0.067	0.06	< 0.012	< 0.012
	CHLOROMETHANE	UG/L	0.036 JBu	0.039 JBu	0.065 Bu	0.035 JBu	0.029 JB	0.024 JB
	CIS-1,2-DICHLOROETHENE	UG/L	< 0.012	2.9	< 0.012	< 0.012	< 0.012	< 0.012
	CIS-1,3-DICHLOROPROPENE	UG/L	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017
	DIBROMOMETHANE	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
	DICHLORODIFLUOROMETHANE	UG/L	0.095 Bu	0.12 Bu	0.11 Bu	0.11 Bu	0.16 B	0.14 B
	DI-ISOPROPYL ETHER	UG/L	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016
	ETHYLBENZENE	UG/L	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
	FLUOROTRICHLOROMETHANE	UG/L	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
	HEXACHLOROBUTADIENE	UG/L	< 0.018 Zj	< 0.018 Zj	< 0.018 Zj	< 0.018 Zj	< 0.018 Z	< 0.018 Z
-	ISOPROPYLBENZENE	UG/L	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013
	METHYLENE CHLORIDE	UG/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	METHYL-TERT-BUTYL-ETHER	UG/L	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021
	NAPHTHALENE	UG/L	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022
	N-BUTYLBENZENE	UG/L	< 0.01	< 0.01	< 0.01	< 0.01`	< 0.01	< 0.01
	N-PROPYLBENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
	P-ISOPROPYLTOLUENE	UG/L	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
_	SEC-BUTYLBENZENE	UG/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
	STYRENE	UG/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
	TERT-BUTYLBENZENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
	TETRACHLOROETHENE	UG/L	< 0.011	< 0.011	0.13	0.13	< 0.011	< 0.011
\	TETRAHYDROFURAN	UG/L	< 0.38	< 0.38	< 0.38	< 0.38	< 0.38	< 0.38
	TOLUENE	UG/L	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
	TRANS-1,2-DICHLOROETHENE	UG/L	< 0.009	0.061	< 0.009	< 0.009	< 0.009	< 0.009
	TRANS-1,3-DICHLOROPROPENE	UG/L	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
	TRICHLOROETHENE	UG/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
	VINYL ACETATE	UG/L	< 0.15	< 0.15	< 0.15	< 0.15 _\	< 0.15	< 0.15
	VINYL CHLORIDE	UG/L	< 0.014	0.74	< 0.014	< 0.014	< 0.014	< 0.014
	XYLENE, M + P	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
	XYLENE, O	UG/L	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009
	XYLENE, TOTAL	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023
				•				
	1,2-DICHLOROETHENE, TOTAL	UG/L	< 0.012	2.961	< 0.012	< 0.012	< 0.012	< 0.012
	TOTAL BTEX	UG/L	< 0.023	< 0.023	< 0.023	< 0.023	. < 0.023	< 0.023
	TOTAL CHLORINATED ETHENES	UG/L	< 0.028	3.701	0.13	0.13	< 0.028	< 0.028
	TOTAL CHLORINATED VOC	UG/L	< 0.07	3.989	0.197	0.19	0.16	0.14
	TOTAL VOC	UG/L	< 0.4	3.989	0.197	0.19	1.789	1.564

APPENDIX E

SITE INSPECTION CHECKLIST AND PHOTO

NUSIEGO SANITARY LANDFILL 5 YR REVIEW INSPECTION 3/18/14

OSWER No. 9355.7-03B-P

	titutional Controls (ICs)			
	Implementation and enforcement			
	Site conditions imply ICs not properly implemented	Yes	No	N/A
	Site conditions imply ICs not being fully enforced	Yes	No	N/A
	Type of monitoring (e.g., self-reporting, drive by) Frequency			
	Responsible party/agency			
	Contact	·····	· · ·	· · · · · · · · · · · · · · · · · · ·
	Name Title	Date		Phone no.
		**		27/4
	Reporting is up-to-date	Yes	No	N/A
	Reports are verified by the lead agency	Yes	No	N/A
	Specific requirements in deed or decision documents have been met	Yes	No	N/A
	Violations have been reported	Yes	No	N/A
	Other problems or suggestions: Report attached			21/22
		· 		~ ^ ~ ~
•	SITU SIGH ON ACLUSS FE	NLO	IN	PLIKO
 . G	Remarks ICS ARE BUNG DEVELOPED SOME IN FLAX eneral	9np 1	- N	91178)
l .	Vandalism/trespassing Location shown on site map Nov Remarks NJ SIENS OF VALDA FENCE IN TACI	andalism LISM	evident Se	RUZITY
2.	Land use changes on site N/A Some Sylow G. Remarks	n Si	TE.	LANCEL
	Land use changes on site N/A Some Sylow G. Remarks	n Si	TE.	LANGEL
2.	Land use changes on site N/A Some Sylow of Remarks SURFALL SOMEWHAT FIRM Land use changes off site N/A Remarks	n Si	TE.	LANGEL
2.	Land use changes on site N/A Some Sylow of Remarks SURFALL SOMEWHAT FIRM Land use changes off site N/A	n Si	TE.	
3.	Land use changes on site N/A Some Sylow of Remarks SURFALL SOMEWHAT FIRM Land use changes off site N/A Remarks	n Si	TE.	LANGEL

B. Otl	her Site Conditions
	Remarks SOME STANDING WATER ON, PERIMETOR CANDELL ROAD DUE tO MELTING SNOW! OID DRIVE AND WALK AROUND AND OVOR LOVER
	VII. LANDFILL COVERS Applicable N/A
A. La	ndfill Surface
1.	Settlement (Low spots) Areal extent Depth Remarks
2.	Cracks Lengths Widths Depths Remarks NO 516N FLAW EKOSION 62 CRACKS MITS
3.	Erosion Location shown on site map Erosion not evident Areal extent Depth Remarks
4.	Holes Location shown on site map Holes not evident Areal extent Depth Remarks
5.	Vegetative Cover Grass Cover properly established No signs of stress Trees/Shrubs (indicate size and locations on a diagram) Remarks CANDFILL COVER BROWN GRASS DUB TO COLD WINTER IN GOOD CONDITION
6.	Alternative Cover (armored rock, concrete, etc.) Remarks
7.	Bulges Location shown on site map Bulges not evident Areal extent Height Remarks

	IX. GROUNDWATER/SURFACE WATER REMEDIES	Applicable N/A			
A. Gr	oundwater Extraction Wells, Pumps, and Pipelines	Applicable N/A			
1.	Pumps, Wellhead Plumbing, and Electrical Good condition All required wells properly operating. Remarks / COOP (ON) (10)	Needs Maintenance N/.	A 15 iSM		
2.	Extraction System Pipelines, Valves, Valve Boxes, and Other A Good condition Needs Maintenance Remarks	••	······································		
3.	Spare Parts and Equipment Readily available Good condition Requires upgra Remarks	de Needs to be provided	 .		
B. Su	urface Water Collection Structures, Pumps, and Pipelines A	pplicable N/A			
1.	Collection Structures, Pumps, and Electrical Good condition Needs Maintenance Remarks		·		
2.	Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances Good condition Needs Maintenance Remarks				
3.	Spare Parts and Equipment Readily available Good condition Requires upgrant Remarks		i		

TRL PRIVIDED ALUTSS AS THEY LUGGO PERFORMING OSM MONITORING ON SITE DURING INSPECTION-

C.	Treatment System	Applicable	N/A				
1.	Air stripping Filters Additive (e.g., chelation Others Good condition	Oil/wate Carbon on agent, flocculent)_ Needs M	er separation adsorbers Maintenance	Bioremediation			
	Sampling ports proper Sampling/maintenance Equipment properly ic Quantity of groundwa Quantity of surface wa Remarks	e log displayed and up entified ter treated annually_ ter treated annually_		_			
2.	Electrical Enclosures as N/A Goo Remarks	nd Panels (properly r d condition	Needs Maintenance				
3.	Tanks, Vaults, Storage N/A Goo Remarks	Vessels d condition	Proper secondary contains	ment Needs Maintenance			
4.	Remarks	d condition					
5.	Treatment Building(s) N/A Goo Chemicals and equipm Remarks	d condition (esp. roof ent properly stored	and doorways)	Needs repair			
6.	Monitoring Wells (pump Properly secured/locked All required wells located Remarks	d Functioning		Good condition GPT FOR THOSE DCT NG			
D. I	D. Monitoring Data						
1.	Monitoring Data Is routinely so	ıbmitted on time	Is of acceptable quali	ty			
2.	Monitoring data suggests Groundwater plume is		Contaminant concent	rations are declining			

D. Monitored Natural Attenuation						
Monitoring Wells (natural attenuation remedy) Properly secured/locked Functioning Routinely sampled Good condition All required wells located Needs Maintenance N/A Remarks						
X. OTHER REMEDIES						
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.						
XI. OVERALL OBSERVATIONS						
A. Implementation of the Remedy						
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).						
B. Adequacy of O&M						
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. OHM BEING POFFORMED ADSOLUTELY, BOTH CAUDFILL MAIN TO MANCO & DAM SAMPLING						

C.	Early Indicators of Potential Remedy Problems		
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.		
	15500S NOTED SIGNIFICANT MUSLEM		
D.	Opportunities for Optimization		
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.		
.			
·			



UNDERTAKEN BY

MUSKEGO SITE REMEDIATION GROUP
MUSKEGO SITE GROUNDWATER REMEDIATION GROUP

AUTHORIZED PERSONNEL ONLY

FOR MORE INFORMATION CALL (2621253-8626